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Improving Data on Poverty in the Third World

The World Bank's Living Standards Measurement Study

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An account of the World Bank's ambitious effort to collect household-level data on poverty in developing countries — and of what that data are beginning to say about the effects of government policies on living conditions of the poor.

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This paper — a product of the Welfare and Human Resources Division, Population and Human Resources Department — is part of a larger effort in PRE to examine the causes and consequences of poverty in developing countries. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Angela Murphy, room S9-137, extension 33750 (36 pages with tables)

The starting point for reducing world poverty was to provide accurate, up-to-date data on poverty in developing countries. The sparse, outdated data previously available were often of dubious accuracy and usually unavailable in a form useful for policy analysis.

One of the most ambitious attempts to improve the quality of data collected at the household level from developing countries is the Living Standards Measurement Study (LSMS) program, which the World Bank launched in 1980.

The main objective of LSMS surveys is to provide household-level data for evaluating the effect of various government policies on the population's living conditions — in studies, for example, of the impact of education on nutrition, the effect of health on employment, and the relationship between income and fertility.

After describing how the LSMS began and how data are collected, Glewwe presents selected results. Some general trends have emerged in studies of five of the six countries for which LSMS data are available:

Most of the poor are in rural areas; the fraction of the poor population in rural areas is always substantially higher than the fraction of the total population in rural areas.

Most of the poor are in households in which the head works in agriculture. The heads of poor households are most likely to be self-employed, especially in Africa. (Very few heads of poor households work for the government, so freezes on government wages are unlikely to hurt many of the poor.)

The heads of poor households have low levels of education — most of them elementary education or less, and in some (particularly African) countries no education at all.

Glewwe also presents selected results of studies on the persistence of poverty, and of studies of the effects on the poor of structural adjustment, of food stamps and food subsidies, and of raising user fees for health care and education.

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The World Bank's Living Standards Measurement Study

by
Paul Glewwe

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I. Introduction

The extent of poverty in developing countries, and the choice of policies to reduce poverty, have long been of interest to scholars, governments, international organizations and many other groups and individuals. The starting point for work in this area is data on poverty in developing countries that is both accurate and up to date. Unfortunately, the data actually available from these countries are often sparse, outdated, of dubious accuracy and not available in a form useful for policy analysis. In recent years several attempts have been made to increase both the quantity and the quality of data from the developing world. Much of this data is useful for poverty analysis, and indeed some has been gathered specifically with this purpose in mind.

One of the most ambitious attempts to improve the quality of data collected at the household level from developing countries is the Living Standards Measurement Study (LSMS) program at the World Bank. This program is specifically aimed at improving data collection efforts so as to better understand the extent of poverty and the determinants of living standards. This paper provides a description of LSMS activities since its inception in 1980. It is organized as follows. Section II sketches a brief history of the LSMS project at the World Bank. The next section presents an overview of the statistical and economic methodology underlying the LSMS data collection efforts. Section IV provides several examples of the use of LSMS data for evaluation of the extent of poverty in developing countries and the analysis of the effect of particular policies on the poor. Section V summarizes the results and concludes the paper.

II. The History of LSMS

A. The State of Data on Poverty in the Third World Previous to LSMS

At the close of World War II three international organizations were founded which would, among other responsibilities, play a major role in developing data collection systems throughout the world: the United Nations, the World Bank (International Bank for Reconstruction and Development), and the International Monetary Fund (IMF). Also after the close of World War II, the European powers began to undertake the process of decolonization, so that by the 1960's most developing countries were newly independent nations. Perhaps the first systematic attempt to ensure that data collected from both developed and developing countries were comparable was the introduction of the United Nation's System of National Accounts. Beginning in late 1940's and early 1950's the UN developed an accounting procedure for calculating economic aggregates such as Gross Domestic Product, which presented a picture of national economies. These procedures were substantially revised in the early 1960's, and data collection efforts spread to other kinds of information, such as data on education (UNESCO), labor force activity (ILO), health (WHO), and agriculture (FAO).

While these steps were a major achievement in the international collection of economic and social data, the published numbers were often national averages, and as such provided little information on the distribution of income and consumption. This in turn meant that they had limited use in the measurement of poverty. To improve on these efforts data had to be collected at the household level, either in the form of a census or a household sample survey. Such types of data collection had long been in existence in many

developed countries (the United States has collected census data for nearly 200 years) and even in some developed countries as well (e.g. Sri Lanka undertook a household expenditure survey in 1953 and a census in 1901). However, for most developing countries data of this type were hard to come by, and the data that were available suffered from a variety of problems, such as non-representative samples, doubtful reliability, and very long time lags between data collection and the production of published reports.

The international community undertook several programs to improve data collection efforts at the household level in developing countries. One of the most important is the United Nations Household Survey Capability Program (UNHSCP), which began in the late 1970's. An early description is given in UNSO (1980). In contrast, data collection at the household level has never been done at the IMF and before the 1980's was undertaken only for special purposes at the World Bank (e.g. an urban household survey in Bogota, Colombia, in 1973).

Parallel to these developments, in the early 1970's there was an increasing recognition, both inside and outside the World Bank, that development efforts needed to pay more attention to the scope and nature of poverty in the Third World. Robert MacNamara, the president of the World Bank from 1968 to 1981, announced a major change in the focus of World Bank activities in Nairobi, Kenya, in September, 1973: the World Bank would promote projects designed to directly improve the living conditions of the poor. To support this work, the World Bank's Development Research Center, under the direction of Hollis Chenery, turned much of its attention to questions of poverty and inequality. This increased emphasis on the poor brought out the need for better data at the household level, and it eventually led to a new

entity within the World Bank which would examine ways to improve data collection efforts in developing countries, the Living Standards Measurement Study.

B. LSMS from 1980 to 1985: The Development of LSMS Methodology

In 1980 the World Bank established the Living Standards Measurement Study (LSMS) to explore ways of improving the type and quality of household survey data collected by statistical offices in developing countries.^{1/} Its ultimate goal is to promote the use of household data as a basis for making policy decisions in these countries. Soon after its inception, LSMS undertook a major review of the state of data collection as it then existed in developing countries with the objective of developing a new system of data collection at the household level. This work was the major focus of LSMS activities in the early 1980's.

This early LSMS work can be divided into two types: (1) review of past experience in the collection of household data; and (2) theoretical work on various aspects of living standards, with special emphasis on how data should be collected for purposes of doing empirical research. Some of the earliest LSMS reports were assessments of recent experience in collecting household level data in developing countries. These papers, written in the early 1980's, consisted of critical reviews of efforts in Africa, Asia and Latin America (Visaria, 1980; Altimir and Sourrouille, 1980; Scott, de Andre and Chander, 1980; Booker, Singh and Savane, 1980; Wahab, 1980; Musgrove,

^{1/} See Chander, Grootaert and Pyatt (1980) for the original statement of the goals of LSMS.

1982).

The second area of work was at the more theoretical level. To judge whether people are poor requires conceptual definitions of poverty. To reflect the multi-dimensional nature of poverty, special studies were undertaken on different aspects of living standards. Among the papers written were a study on the economic theory of welfare measurement (Deaton, 1980), studies on employment and living standards (Mehran, 1980; Grootaert, 1982; Acharya, 1982), reports on the collection of nutrition and health data in household surveys (Martorell, 1982; Ho, 1982; Sullivan, Cochrane and Kalsbeek, 1982), a similar study on the collection of education data (Birdsall, 1982), and several other papers looking at topics ranging from collection of price data to the usefulness of collecting panel data.

The end product of five years of work was the development of a household survey methodology which was first implemented in Côte d'Ivoire in 1985. The questionnaires used are explained in Grootaert (1986) and the implementation of the survey in Côte d'Ivoire is explained in Ainsworth and Munoz (1986).

C. Present LSMS Survey Activities

As seen in Table 1, six LSMS surveys have been put in the field, and there are plans to begin three more in the next few months. The Côte d'Ivoire Living Standards Survey (Enquête Permanente Auprès Des Ménages) began in February, 1985, and by 1989 4 years of data had been collected. The Peru Living Standards Survey (Encuesta Nacional de Hogares Sobre Medición de Niveles de Vida) went into the field in July, 1985 and collected one year of data. Future surveys in Peru are now under consideration. Field work for the Ghana Living Standards Survey began in September, 1987, and so far 2 years of

TABLE 1: LSMS Surveys

I. Data Now Available	<u>Country</u>	<u>Years of Data Collection</u>
	Côte d'Ivoire	1985, 1986, 1987, 1988
	Peru	1985-86
	Ghana	1987-88, 1988-89
	Mauritania	1987-88
	Bolivia	1988, 1989
	Jamaica	1988, 1989

II. Soon to be Implemented	<u>Country</u>	<u>Expected Date in Field</u>
	Laos	Fall, 1990
	Morocco	Spring, 1990
	Pakistan	Fall, 1990

III. Discussions Underway:	<u>Latin America/Carribean</u>	<u>Africa/Middle East</u>	<u>Asia</u>
	Brazil	Algeria	Nepal
	Colombia	Burkina Faso	
	Guatemala	Egypt	
	Trinidad and Tobago	Jordan	
	Venezuela	Kenya	

data have been collected. The Mauritanian Living Standards Survey (Enquête Permanente sur les Conditions de Vie Des Ménages) became operational in December, 1987. The Bolivian survey (Encuesta Integrada de Hogares) began in May, 1988. Finally, the Jamaican Survey of Living Conditions began operations in August, 1988.

Three more LSMS surveys are due to go into the field by late 1990. The first is the Moroccan Living Standards Survey (Enquête Sur le Niveau de Vie des Mâages au Maroc) will begin field work in the spring of 1990. The second is a living standards survey in Pakistan (Pakistan Integrated Household Survey), which is scheduled to begin field work in late 1990. The last is the Laos Living Standards Survey, which will also begin field work in late 1990.

Several more countries have indicated interest in undertaking LSMS surveys, and discussions are now underway to see whether they will go forward. In Latin America and the Carribean discussions have been held in Brazil, Colombia, Guatemala, Venezuela and Trinidad. In Africa and the Middle East discussions have been initiated in Algeria, Burkina Faso, Egypt, Jordan and Kenya. In Asia, Nepal has shown interest in LSMS surveys.

The three African surveys (Côte d'Ivoire, Ghana and Mauritania) are now being managed by the SDA (Social Dimensions of Adjustment) Project in the Africa region of the World Bank. This project aims to strengthen the capacity of African governments to design and monitor poverty programs and projects. It is being managed jointly by the World Bank, UNDP, and the African Development Bank.

D. Future Survey Implementation

The LSMS program began as an experimental research project but has

now evolved into a permanent World Bank development effort. The original Living Standards Unit of the Development Research Department has become the Welfare and Human Resources Division of the Population and Human Resources Department, which in turn is part of the Policy, Research and External Affairs (PRE) complex of the World Bank. The transition from a research project to a permanent entity highlights the need for a more systematic process for starting new LSMS surveys.

Future LSMS work will focus on: (1) refinements and diversification of the LSMS survey system, and (2) expanded research activities. Regarding the former, new questionnaires are being developed based on LSMS experience in several countries in the late 1980's. Attention will be given to adding flexibility, so as to allow for adaption to the special characteristics of individual countries, and to refinements in computer software and hardware systems, to allow for easier and faster implementation of surveys. In terms of the latter, emphasis is being given to developing research capability in the countries in which LSMS surveys are done and in undertaking new types of research at the World Bank in Washington.

III. LSMS Methodology

A. Objective of LSMS Surveys

The main objective of LSMS surveys is to provide household level data for evaluating the effect of various government policies on the living conditions of the population. Accordingly, LSMS surveys collect data on all major aspects of household well-being. In this sense they are multi-topic surveys, gathering data on income, consumption, savings, employment and unemployment, health, education, fertility and contraceptive prevalence, nutrition, housing and migration. Collecting data on these topics from the same households has the added advantage of allowing for the analysis of the relationship between these different aspects of the quality of life. Examples of this include studies of the impact of education on nutrition, of the effect of health on employment, and the relationship between income and fertility.

B. Consumption as an Indicator of Household Welfare

Empirical research on the effect of government policies on households often requires a broad indicator of household welfare. In most LSMS research on poverty, household welfare is measured by consumption.^{2/} When one selects a certain level of consumption as the minimum amount necessary, one has a poverty line.

^{2/} Of course, the LSMS data are rich enough to allow for the use of other indicators of household welfare (cf. Glewwe and van der Gaag, 1988). Household consumption is used in most LSMS studies because of its intuitive appeal and rigorous theoretical framework.

Most people would agree that, other things being equal, increased consumption of goods and services raises individuals' levels of welfare. Much of what we observe in human behavior supports this assumption. Of course, there may be many factors other than the consumption of goods and services that affect welfare, but since these tend to be much more difficult to measure economists usually restrict themselves to that "portion" of human welfare which is attributable to consumption.^{3/}

In welfare economics, the starting point for measuring economic welfare is the utility function, which states that welfare rises as the consumption of various goods and services increases. To compare the welfare of different individuals, it is assumed that each individual or household possesses the same utility function. If one had data on the consumption of individuals, as distinct from the consumption of households, one could analyze the data using a utility function at the individual level.

Unfortunately, most consumption data are collected at the household level and as such require analysis using a household level utility function. Thus one assumes that household utility is a function of the consumption of goods and services and the composition of household members. The composition "adjustment" is needed to account for the fact that households with different compositions require different consumption levels to attain the same level of welfare (e.g. larger households need more goods and services to attain the

^{3/} Household surveys usually collect data on income as well as consumption, and some studies of welfare focus on the income data. Yet economic theory assumes that it is consumption, not income (which may be saved or given away), that raises welfare, and in most surveys consumption data appear to be more reliable than income data.

same welfare level as smaller households). Again, it is necessary to assume that all households possess the same household utility function. Another consequence of the presence of consumption data at the household rather than the individual level is that one does not know the distribution of welfare within the household; one has little choice but to assume that all household members enjoy the same level of welfare.

While one would like to observe the actual utility levels of households, one only observes their levels of consumption. Yet these are monotonically related. Specifically, "money-metric" utility, which is defined as the amount of money required (given a set of prices) to attain a specified level of utility, is equal to observed levels of consumption under the assumption of utility maximization.^{4/}

Given consumption data at the household level, adjustments must be made for household size and differences in prices. Additional household members, particularly children, are less "costly", in the sense of requiring additional consumption to maintain the welfare level of the household, relative to the initial cost of attaining that welfare level in a household composed of a single person or a childless couple. This idea is supported by both common sense and economic reasoning. Clothing and other items can be handed down from older to younger children, durable goods such as radios and refrigerators can be enjoyed by additional members at no extra cost, and even in the case of food children consume less than adults. The method for adjusting for this phenomenon is the estimation of "adult equivalence scales",

^{4/} For a thorough presentation see Deaton and Muellbauer (1980).

which measure the "cost" of additional household members in terms of fractions of adults (cf. Deaton and Muellbauer, 1980, Ch. 8). In addition, money-metric measures of utility also need to be adjusted for differences in prices. This can be done by dividing the value of household consumption by a price index.

These theoretical considerations imply that household surveys must collect the necessary data for creating a comprehensive measure of household consumption, including data needed to adjust for differences in household size and in prices faced by households. LSMS surveys begin with direct consumption data, which include all explicit expenditures in the last 12 months as well as the value of food produced and consumed by the household. In addition to this, there is also a consumption component from the ownership of housing and durable goods (e.g. cars, televisions, bicycles, cameras), which are not consumed when they are built (housing) or purchased (durables) but are used over a long period of time. Household welfare derived from the ownership of such goods can be based on estimated yearly rental values of those goods. For housing, the best approach is to estimate hedonic rent equations (i.e. to predict the rental value of housing based on the characteristics of the dwelling) for those households which are renters. From these estimates imputed rents for owner-occupied housing can be calculated. For other durable goods, the rental value can be estimated based on depreciation in the real value of those goods over time. LSMS surveys collect data both on dwelling characteristics and on the ownership of durable goods which are sufficient to calculate the appropriate rental values both. They also collect data on household composition and local market prices so that adjustments can be made for their variation across households.

C. Distinctive Characteristics of LSMS Surveys

Aside from collecting the data needed to get a comprehension measure of consumption, LSMS surveys are different from other household surveys in several other respects. First, while other surveys are primarily designed to measure different aspects of living standards, LSMS surveys collect information which allows one to analyze the determinants of the various outcomes that one observes. For example, school attendance of children may depend on the distance to the nearest school. The need for data on determinant factors explains why LSMS surveys collect data on prices, local schools and health services (including distance from the households and fees charged), conditions of local infrastructure (roads, sources of fuel and water, availability of electricity, communications, etc.), local agricultural conditions and practices, and historical information on household members themselves (characteristics of parents, employment history, migration history, etc.). Further, information at the household level is gathered on special government poverty alleviation efforts such as feeding programs, food subsidy schemes, employment generation efforts, food stamp programs, etc. In fact, many parts of the questionnaire have been designed by those who will use the data: economists, demographers, nutritionists and other researchers. This insures that the data collected are of the sort that can be used effectively to analyze the impact of government programs on household welfare.

Second, since information is collected rather intensively at the household level, LSMS surveys tend to have a smaller sample sizes in order to focus on data quality, rather than quantity. The amount of information collected from households is quite large, so attempts are made to minimize the

interview time of individual household members (e.g. the household questionnaire is filled out in two interviews two weeks apart). The quality of the data collected is enhanced by intensive supervision of all aspects of the survey work, as explained below.

Third, the need for policy relevant data implies that the data must be made available quickly. With this in mind LSMS surveys have pioneered the use of personal computers at all levels of survey operations, from design of questionnaire pages to data entry in the field to analysis of the data. The use of the latest computer technology allows for better quality control (data collected from a household's first interview is entered on personal computers and checked for internal consistency before the household is interviewed again) and rapid data analysis. In the first survey in Cote d'Ivoire, a preliminary statistical abstract on the first 6 months of data was available within 2 months of the last interviews in the field. In Jamaica, a report covering issues of health, education, and the impact of food subsidies, food stamp and school feeding programs on the poor was prepared in Kingston in October 1988 using data collected in August 1988, despite a devastating hurricane that occurred in early September of the same year.

Fourth, LSMS surveys are flexible and adaptable to the particular characteristics and policy issues of any given country. The computer-based technology of the LSMS allows for flexibility and speed of implementation for particular countries. The basic questionnaire can easily be supplemented with special modules focusing on specific information needs. Examples of this are the collection of additional health care information (e.g. health facility questionnaire) in the third year of the Côte d'Ivoire survey and supplemental

education data (testing of household respondents and local school questionnaire) in the second year of the Ghana survey.

D. Organization and Implementation

The standard LSMS survey gathers data on three types of questionnaires. The largest and most time-consuming of these is the household questionnaire. It consists of 16 sections; sections 1-8 are filled in on the first visit to the household, sections 9-15 are filled in on the second visit, which occurs two weeks after the first, and section 16 (anthropometrics) is filled in in both visits. The information gathered in each of these sections is given in Table 2. For details see Grootaert (1986), Ainsworth and Munoz

TABLE 2: Sections in LSMS Household Questionnaire

<u>First Visit</u>	1. Household Roster 2. Housing Amenities and Expenditures 3. Education 4. Health 5. Employment and Personal Activities 6. Migration 7. Selection of Respondents for Second Visit 8. Dwelling Characteristics
<u>Second Visit</u>	9. Agricultural Activities 10. Non-Agricultural Household Enterprises 11. Expenditures on Non-Food Intras 12. Expenditures on Food and Consumption of Food Produced by the Household 13. Fertility 14. Other Income 15. Savings and Borrowing
<u>Both Visits</u>	16. Anthropometric Data (Height and Weight)

(1986) and Ainsworth and van der Gaag (1987). An average visit to fill out half of the household questionnaire takes about 2-3 hours, though the questionnaire is designed so that no individual need be interviewed for more than an hour.

The other two components of a typical LSMS survey are the price and community questionnaires, the latter of which is administered in rural areas only. In order to measure the true purchasing power of household incomes, it is necessary to have data on prices faced by households. The LSMS price questionnaire gathers data on consumer prices from local markets for both food and non-food items. In some cases prices are also gathered for medicines and agricultural inputs as well. The community questionnaire collects information on local conditions in rural areas, including the nearest schools and medical facilities, common agricultural practices (including agricultural wage rates) transportation and communications, and other "infrastructure" data. These data are crucial for studying the effects of a wide variety of government policies on various aspects of living standards. For example, they have been used to analyze the effects of user fees on the demand for medical care and for schooling, and the effect of commodity prices on agricultural productivity.

The LSMS questionnaires are completed by several mobile survey teams, each of which contains one supervisor, two interviewers, one anthropometrist, and one data entry operator. Each team can cover two communities in four weeks, where 16 households are interviewed in each community. During the first week the first half of the household questionnaire is filled out in one community, and in the following week the first half of that questionnaire is filled out in the other community. In the third and fourth weeks the second

half of the questionnaires are filled out in the first and second communities, respectively. The supervisor is in charge of filling out the community questionnaire, while the anthropometrist weighs and measures the height of all household members and fills out the price questionnaire. After the first week's work is finished in the first community, the team takes the half-completed household questionnaires to the data entry operator, who is located in the regional capital. The data from those half-completed questionnaires are then entered on diskettes using personal computers (PC's) which are programmed to detect inconsistencies and coding errors in the data. Before the team returns to the first community at the beginning of the third week, they pick up computer printouts from the data entry operator and use them to correct any inconsistencies or errors from the first week's work by going over the questions again with the households during the second visit. This greatly increases data accuracy. After a four week period has ended, the teams have a one week break, during which they often return to the capital city and bring the computer diskettes with the "fresh" data.

The quality of LSMS survey data is further enhanced by heavy supervision at all levels, most of the work of the supervisor is to check the work of the other team members. Every household questionnaire is checked by the supervisor both before and after data entry, and the work by the data entry operator and the anthropometrist is also constantly being checked by him. The supervisor also visits some of the households after interviewers have left to see if they performed their work correctly and were polite to the respondents. In addition, higher level officials make unannounced visits to the teams in the field to inspect their work, including that of the supervisor. Team members whose work is deficient are replaced by standbys who

have received the same training as the team members.

Once six months or a full year of interviews have been completed, statistical abstracts are jointly put together by the World Bank and the statistical offices of the countries. As mentioned above, these have been completed within just a few months thanks to the computerized nature of data collection. Further studies are undertaken both at the World Bank and in the country itself. The data always remain the property of the statistical offices of the respective countries.

IV. Selected Results from Studies on Poverty Using LSMS Data

Even though the data from LSMS surveys have only been available in the past three years, there has already been a large number of studies using these data. Many of these studies have focused on poverty in developing countries. This section provides a sample of the results that have implications for poverty policies.

A. Poverty Profiles

Perhaps the first information one would like about the poor is a description of who they are. Once this has been learned one can do more sophisticated analyses using the LSMS data. Table 3 presents some characteristics of the poor in the five of the six countries for which LSMS data are available. More detailed information are available in Glewwe (1987a), Glewwe (1987b) and Glewwe and Twum-Baah, 1990).

There are some general trends vident in all five countries in Table 3. First, most of the poor are found in rural areas. This is consistent with virtually every study of poverty in developing countries. Although the numbers are not shown here, the fraction of the poor population found in urban areas is always substantially higher in all 5 countries than the fraction of the total population found in rural areas.

Second, most of the poor are found in households in which the head has an agricultural occupation. Similarly, the heads of poor households are most likely to be self-employed. Note an interesting implication of this - very few of the heads of poor households work for the government. This suggests that freezes on government wages are not likely to hurt a substantial number of the poor. Third, the heads of poor households have relatively low

TABLE 3: Characteristics of the Poorest 30% in Five Countries

<u>Location</u>	<u>Côte d'Ivoire</u>	<u>Peru</u>	<u>Ghana</u>	<u>Jamaica*</u>	<u>Mauritania</u>
Urban	14.3%	31.8%	18.7%	25.5%	9.8
Rural	86.7	68.2	81.3	73.5	90.2
<u>Occupation of Head</u>					
None	0.1%	4.7%	4.8%	31.3%	45.9
Agricultural	87.5	61.2	77.3	41.0	43.7
Sales/Services	7.8	13.6	5.2	20.3	5.5
Industrial/Craft	2.3	18.3	9.9	1.2	3.6
Management/White Collar	1.5	2.2	3.0	0.0	1.1
Other	0.9	0.0	0.0	6.2	0.2
<u>Education of Head</u>					
None	84.6%	25.4%	69.8%	} 84.0	99.0
Primary	13.9	62.9	9.4		0.7
Secondary	1.4	10.8	19.7	15.3	0.3
Post-Secondary	0.1	0.9	2.2	1.2	0.0
Other	0.0	0.0	0.0	3.2	0.0
<u>Employer of Head</u>					
None	0.1%	4.7%	5.2%	31.3%	45.9
Government	1.6	3.6	7.6	2.2	2.2
Private	3.2	20.1	3.8	13.6	4.3
Self-Employed	95.1	71.6	83.5	50.3	47.6
Other/Unknown	0.0	0.0	0.0	2.7	0.0

* Jamaica figures refer to poorest 20%.

levels of education - the vast majority have an elementary education or less, and in some countries most have no education at all.

Yet there are also some differences across these five countries. Most strikingly, the heads of poor households in Jamaica and Mauritania are quite likely to be without jobs, either unemployed or out of the labor force. This is not the case in the other 3 countries. Second, in Jamaica and Peru about 10 to 20 percent of the poor live in households where the head works for a private employer, but in the three African countries this percentage is substantially smaller. Third, in Peru most poor households are headed by someone who has had at least an elementary level of education, but in the African countries heads of poor households usually have no education at all.

B. Comparability of Different Poverty Definitions: Results from Côte d'Ivoire

As poverty is a multi-dimensional concept, there are many ways of defining poverty. Some definitions focus on income, others on expenditures, and for both cases some look at household figures and others look at per capita figures. Others focus on food intake using data such as food expenditures, the fraction of total expenditures going towards food, and nutritional definitions. Some look to the living conditions of households (basic needs), using concepts like "adequate housing" and "adequate health care." One could even define poverty in terms of productive assets, such as agricultural land or education of household members.

Do these definitions usually classify the same people as poor, or do they each point to a separate group as "the poor." A recent paper by Glewwe and van der Gaag (1988) using the LSMS data from Côte d'Ivoire addresses these

TABLE 4: Correlation of Alternative Definitions of Poverty with the Adjusted Per Capita Consumption Definition: Côte d'Ivoire

Definition	Percentage of Population Accurately Identified			χ^2 Statistic (d.f. = 1)
	Poor	Non-Poor	Total	
<u>Urban Areas</u>				
Per capita income	16.80	56.85	73.65	105.2754*
Household consumption	17.67	57.84	75.51	102.2547*
Per capita consumption	26.08	66.12	92.20	413.9545*
Per capita food consumption	22.64	62.67	85.31	262.0501*
Food ratio	14.23	54.24	68.47	30.8790*
Height for age	8.70	49.47	58.17	0.2791
Weight for height	8.95	49.01	57.96	0.4649
Per capita floor area	13.26	53.48	63.74	32.9857*
Adult school attainment	13.41	53.69	67.10	31.9716*
<u>Rural Areas</u>				
Per capita income	17.70	57.60	75.30	166.7868*
Household consumption	19.93	59.90	79.83	209.0987*
Per capita consumption	26.43	66.38	92.81	595.2563*
Per capita food consumption	22.84	62.85	85.69	359.0950*
Food ratio	10.19	50.17	60.36	3.4448
Height-for-age	10.82	51.21	62.03	1.3537
Weight-for-height	9.56	50.07	59.63	0.0833
Per capita floor area	7.57	47.51	55.28	1.5571
Adult schooling	11.89	51.71	63.60	9.9025*
Agricultural land per capita	11.94	52.00	63.94	17.5915*

Note: One asterisk denotes that the hypothesis of no correlation is rejected by the chi-square test at the 1 percent level.

issues. The paper takes several commonly used definitions of poverty in examines whether they select the same group as poor as does an equivalence scale adjusted per capita consumption measure. In both urban and rural Côte d'Ivoire, the answer is often "no." As seer in Table 4, definitions of poverty based on income data, agricultural land, and adult schooling are somewhat questionnable, and definitions based anthropometric measures (weight for height or height for age), the fraction of total expenditures devoted to food or the floor area of the dwelling can be completely uncorrelated or only weakly correlated with a (equivalence scale adjusted) consumption-based definition of poverty. Whether this is true in other countries is a topic for future research.

The paper by Glewwe and van der Gaag also points out that different definitions of poverty have different biases. For example, per capita income and per capita expenditure tend to select large households, while total family expenditure selects small households. Using agricultural land as a definition in rural areas often selects relatively well to do households whose income derives from sources other than agriculture. Finally, some definitions are more likely to classify urban residents as poor than others (such as ones that tend to pick smaller households as poor).

C. Structural Adjustment and the Poor

Two recent papers by Glewwe and de Tray (1988, 1989) focus on issues of structural adjustment and the poor in two countries with LSMS data, Côte d'Ivoire and Peru. Both papers discuss many aspects of structural adjustment, but here the discussion will be limited to the effect of structural adjustment

policies on producer and consumer prices. The impact on prices is important because structural adjustment programs often focus on "getting the prices right," i.e. allowing domestic prices to approach international price levels. In many cases this means that consumer and producer price subsidies will be reduced or halted, thus increasing prices. Some prices may decrease if taxes or import restrictions are removed.

The data in Table 5 provide some idea of the impact of price changes on the poor in their role as agricultural producers. Turning first to the case of Côte d'Ivoire, we see that both poor and non-poor households grow the two major export crops, coffee and cocoa, in the same proportion as the rest of the population; thus changes in the prices of either would have roughly the same impact on the poor as they would on the non-poor. In contrast, cotton is

TABLE 5: Crops Grown by the Poor and Non-Poor in Côte d'Ivoire and Peru

Country	Crop	Percent Within Group Who Cultivate the Crop			
		Poorest 10%	Poorest 30%	Wealthiest 70%	All
Côte d'Ivoire	Cocoa	25.0%	34.2%	26.9%	34.4%
Côte d'Ivoire	Coffee	34.1	41.4	35.8	37.5
Côte d'Ivoire	Cotton	27.6	19.8	3.9	8.7
Côte d'Ivoire	Sugar	0.4	1.2	2.6	2.2
Peru	Maize (yellow)	14.3	13.9	8.3	10.0
Peru	Maize (white)	28.9	22.7	7.8	12.3
Peru	Wheat	29.1	23.4	8.6	13.1
Peru	Cotton	0.3	0.5	1.0	0.8

much more likely to be grown by the poor in Côte d'Ivoire than by the non-poor, which implies that higher prices for that crop would mainly benefit the poor, while lower prices would be especially harmful to them. Finally, sugar is grown by very few poor households, and indeed is more likely to be grown by non-poor households. Thus reductions in producer subsidies to sugar producers in Côte d'Ivoire would have almost no negative effect on the poor.

In Peru producers of yellow maize benefit from very high levels of effective protection. Yet from the viewpoint of the poor, it would be much better to subsidize production of white maize since that crop is much more grown by them than yellow maize. On the other hand, wheat production also receives a high level of effective protection, but this is more favorable for the poor; if this protection were reduced in order to "get prices right" a relatively large proportion of the poor would be hurt. Finally, unlike Côte d'Ivoire, cotton production is very rare among the poor in Peru - any changes in the price of cotton would have almost no effect on the poor in their role as producers.

Of course, "getting the prices right" will affect the poor in their role as consumers as well. Table 6 provides some data on the fraction of total expenditures devoted to specific food items among both poor and non-poor households in Côte d'Ivoire and Peru. Turning first to the Côte d'Ivoire data, one sees that although rice is an important component of food consumption among the poor, they are partially protected against any price increases by the fact that they produce more than half of what they consume. However, this is not true among those poor who are found in urban areas - they produce only a small fraction of what they consume. Unlike wheat, sugar does not constitute such a large fraction of the budgets of the poor, so that

TABLE 6: Budget Shares in Household Consumption in Côte d'Ivoire and Peru

Country	Food Item	Poorest 10%	Poorest 30%		Wealthiest 70%	All
			All	Urban Only		
Côte d'Ivoire	Rice: Purchased	3.2%	3.9%	7.6%	3.9%	3.9%
	Own Produce	3.8	4.2	0.7	1.5	1.8
	Total	7.0	8.1	8.3	5.5	5.7
Côte d'Ivoire	Sugar	0.9	0.9	1.1	0.7	0.7
Côte d'Ivoire	Bread	1.6	1.4	1.7	1.9	1.9
Peru	Wheat: Purchased	0.8	0.7	0.5	0.3	0.4
	Own Produce	4.3	3.2	0.4	0.5	0.8
	Total	5.1	3.9	0.9	0.8	1.2
Peru	Bread	3.8	4.0	5.7	2.1	2.3
Peru	Maize: Purchased	0.9	0.6	0.4	0.4	0.4
	Own Produce	4.1	3.5	0.5	0.9	1.1
	Total	5.0	4.1	0.9	1.3	1.5

reducing producer subsidies to sugar, which would raise the market price, will not have a strong negative effect on poor Ivoirian households. Finally, in Côte d'Ivoire the non-poor spend a somewhat large fraction of their budgets on bread than do the poor, which implies that any policies that lead to increased

bread prices would not be biased against the poor.

Turning to Peru, the domestic consumer price of wheat is nearly twice as high as the international price, but this does not effect the poor very much because they grow most of what they consume. However, to the extent these high prices lead to higher prices for bread, the poor are hurt because they spend a larger proportion of expenditures on bread than do the non-poor. Finally, the consumer price of maize is kept artificially low by the Peruvian government. Despite the fact that the poor spend a larger share of their money on maize than do the rich, attempts to raise that price to international prices should not hurt poor households very much because they produce most of what they consume.

D. The Effect on the Poor of Raising User Fees for Health Care and Education

For many years developing countries have attempted to provide health care services and schooling at little or no cost to the public. The low fees for these services are sometimes justified by appealing to equity considerations. Yet, in many countries these services were provided in urban areas first, while many rural areas did not have adequate schools or facilities, or when they have been built the supplies and staff have been inadequate. Finally, many developing countries are now facing financial problems which may make it difficult, even impossible, to continue providing medical and education services at almost not cost to those who use them. This has led many economists to call for increases in fees paid for schools and medical services in order to expand these services to the rural areas and to ease the financial burden of providing these services. Yet several critics of these proposals have argued that they will hurt the poor and lead to reduced

use of health facilities and schools. The resolution of this dispute depends on empirical evidence, and the LSMS data can be used to answer these questions.

In the area of health care, Gertler and van der Gaag (1989) have used the Cote d'Ivoire and Peru data to answer the question: What will happen to the poor if higher fees are charged for publicly provided health care services? Using a general model of household health care decisions, they estimate price elasticities for different types of health care. These

TABLE 7: Effects of Increased User Fees on Health Care Utilization in Côte d'Ivoire and Peru

		Fraction of Ill Population Seeking Health Care From					
		Hospital		Clinic		Private Doctor	
		Base	Increased Fees	Base	Increased Fees	Base	Increased Fees
Côte d'Ivoire	West Forest	22%	13%	23%	22%	-	-
	Savannah	15%	1%	18%	17%	-	-
Peru	Coastal	9%	8%	7%	7%	12%	12%
	Sierra	11%	4%	10%	9%	3%	6%

Note: 1. Base case represents present fee structure. Increased fees represent substantial cost recovery. See Gertler and van der Gaag (1989) for details.

2. For Peru assume private doctor prices remain unchanged.

elasticities can then be used to predict the impact of user fees on use of health care facilities. The results are presented in Table 7. In Côte d'Ivoire, when fees are raised at both clinics and hospitals to cover a substantial fraction of the cost of providing these services, use of hospital services by the ill in the relatively well off West Forest rural areas declines from 22% to 13%, whereas use of clinics declines only by a small amount. In contrast, in the poor rural Savannah areas use of hospital services virtually disappears. In Peru a similar disparity between rich and poor areas emerges: in the relatively well off Coastal areas increased user fees have almost no effect, but in the poor Sierra rural areas the use of government hospitals declines dramatically.

Turning to the area of education, Gertler and Glewwe (1989) examine whether the poor in rural Peru are willing to pay the costs of building new secondary schools in villages where there is no school at present. Of course, this depends on how far away the nearest secondary schools are. Their results on the willingness to pay for new schools are shown in Table 8. Given an estimated cost of 400 intis per student per year to pay teacher's salaries, Gertler and Glewwe find that in villages where the nearest school is only one hour away (in terms of walking distance) both poor and non-poor households are not willing to pay for a new school in the village. Yet when the nearest school is 2 hours away the willingness to pay rises dramatically - both the poor and the non-poor are willing to bear the cost of paying teachers in return for a new secondary school. This comes about even though the poor are more price-sensitive to increases in school fees than the non-poor.

**TABLE 8: Willingness to Pay to Reduce Travel Time to Secondary School In Rural Peru:
June 1985 Intis per year and Percent of Income**

Travel Time to Nearest School	INCOME QUARTILE								All Income Groups % of Intis Income	
	Poorest 25%		Next 25%		Next 25%		Richest 25%			
	Intis	% of Income	Intis	% of Income	Intis	% of Income	Intis	% of Income		
1 Hour	169	2.3%	182	1.4%	203	1.0%	374	0.8%	232	1.1%
2 Hours	412	5.7%	455	3.5%	508	2.4%	934	1.9%	577	2.8%

E. Food Stamps, Food Subsidies and the Poor in Jamaica

One issue that often arises in poverty alleviation efforts is: To what extent do a program's benefits reach the poor? This is often referred to as the targeting issue. Food subsidies have often come under attack because they seem to benefit the wealthier income groups more than they do the poor. Some kind of food stamp scheme is often put forth as a more effective way of channeling assistance to the poor. The Jamaica Survey of Living Conditions allows one to compare the two different programs since it collects information on both food stamps and the consumption of subsidized food items. In a report recently put out by the Statistical Institute of Jamaica, the beneficiaries of these two programs were identified according to per capita expenditure levels. The results are reproduced in Table 9.

It turns out that although the value of food subsidies in Jamaica is a larger portion of the budgets of poor households than of rich households, in money terms wealthier households receive more benefits than poorer ones; the

monthly value of food subsidies to households in the wealthiest 20% of the population was about 53 Jamaican dollars per capita while the same figure for the poorest 20% of the population was 29 Jamaican dollars. In contrast, food stamps are much more effective in reaching the poor - 51% of the poorest 20% were receiving food stamps compared to only 6% of the wealthiest 20%.

TABLE 9: Incidence of Food Stamp and Food Subsidy Benefits: Jamaica, 1988

	<u>Population Quintiles</u>					<u>All Jamaica</u>
	<u>Poorest 20%</u>	<u>Next 20%</u>	<u>Middle 20%</u>	<u>Next 20%</u>	<u>Richest 20%</u>	
Value of Food Subsidies Received (Jamaican Dollars per person per month)	28.6	39.6	39.5	42.5	52.5	40.5
Percent of Households Receiving Food Stamps	50.6	37.1	26.3	17.0	6.0	23.4

F. Persistence of Poverty in Developing Countries

In developed countries, some households remain in poverty for many years, if not decades, while others move in and out of poverty over relatively short periods of time. What is the pattern found in developing countries? Most LSMS surveys are permanent surveys, i.e. they repeat every 12 months. In such cases it is useful to interview the same households in succeeding years to see how their economic status changes from year to year. In those LSMS surveys which are permanent, half the households interviewed in one year are reinterviewed in the following year. At the most simple level of analysis,

this allows one to see whether there is much movement in and out of poverty over a one year period.

The data in Table 10 present data on the persistence of poverty for the first two LSMS surveys for which multi-year (panel) data are available. It is evident that in both Côte d'Ivoire and Ghana there is substantial movement in and out of poverty in a relatively short period of time. Of the poorest 30% (approximately 22.6% + 7.1%) of the population in Côte d'Ivoire in 1985, nearly one fourth (7.1%) were not poor in 1986, and of the poorest 29% (16.4% + 12.3%) in Ghana in 1987-88, about 40% (12.3%) were not poor the following year. While this movement suggests that many of the poor are only poor for a year or two, a careful analysis is necessary before any further conclusions can be drawn.

TABLE 10: Persistence of Poverty in Developing Countries

<u>Côte d'Ivoire</u>		<u>1986</u>	
		Poorest 30%	Other 70%
<u>1985</u>	Poorest 30%	22.6%	7.1%
	Other 70%	16.1%	54.2%
<u>Ghana</u>		<u>1988-89</u>	
		Poorest 30%	Other 70%
<u>1987-88</u>	Poorest 30%	16.4%	12.3%
	Other 70%	15.7%	55.7%

V. Conclusion

In order to formulate effective policies to reduce poverty in developing countries, the nature and causes of poverty must be well understood. This requires data from these countries which are relevant, detailed, accurate and up to date. The LSMS program was developed at the World Bank to meet this need. The surveys undertaken so far have provided a wealth of information on poverty in developing countries and have been used in a number of studies which examine the impact of various government policies on the poor. Much more can be done with the existing data, and as more countries undertake LSMS surveys a better understanding of poverty in developing countries will emerge.

Of course, there is room for improvement in the design and implementation of LSMS surveys, and new techniques will continue to be explored both in terms of data collection and research. Many lessons can be learned from the experience of other household survey programs, such as the United Nations Household Survey Capability Program (UNHSCP) and household survey activities in the developed countries. At the same time this experience must be conveyed to the statistical and research organizations in developing countries so that their participation in this process can be increased.

When Robert MacNamara declared in 1973 that the World Bank would direct its attention toward improving the plight of the poor in developing countries, it was not always clear how this could be done, and indeed some skeptics may have honestly thought that very little could be done. The development of the LSMS program at the World Bank constitutes an important

step in transforming this commitment from an abstract idea to a concrete agenda. In concert with other poverty related work, both at the World Bank and at other institutions around the world committed to poverty alleviation, it would not be overly optimistic to hope that significant progress can be made in improving the quality of life in developing countries in the 1990's and on into the 21st century.

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